CLAIMS

1. An engine control system that identifies fuel dynamical steady state (FDSS), comprising:

an engine including at least one cylinder; and

a controller that determines a detection period, monitors a mass of fuel ingested by said cylinder during said detection period and indicates FDSS if said mass of fuel remains within a predetermined range during said detection period.

2. The engine system of claim 1 wherein said mass of fuel is a measured mass of fuel.

3. The engine system of claim 1 wherein said mass of fuel is a commanded mass of fuel.

4. The engine system of claim 1 wherein said detection period is at least one engine cycle.

5. The engine system of claim 1 wherein said controller monitors an air to fuel (A/F) ratio within said cylinder and monitors a mass of air ingested by said cylinder.

6. The engine system of claim 5 wherein said mass of fuel is based on said A/F ratio and said mass of air ingested by said cylinder.

7. The engine system of claim 5 wherein said A/F ratio is shifted to be contemporaneous with an intake event of said cylinder during a current engine cycle.

8. The engine system of claim 5 wherein said mass of air ingested is shifted to be contemporaneous with a current A/F ratio.
07/15/2003

9. The engine system of claim 1 wherein said controller determines an average mass of fuel for said detection period.

10. The engine system of claim 9 wherein said predetermined range is based on said average mass of fuel.

11. The engine system of claim 9 wherein said predetermined range includes a lower limit based on said average mass of fuel and a steady state threshold.

12. The engine system of claim 9 wherein said predetermined range includes an upper limit based on said average mass of fuel and a steady state threshold.

13. The engine system of claim 1 wherein said predetermined range is based on a steady state threshold.

14. The engine system of claim 13 wherein said steady state threshold is based on an average of said mass of fuel.

15. A method of identifying fuel dynamical steady state (FDSS) of an engine having at least one cylinder, comprising:

determining a detection period;

monitoring a mass of fuel ingested by said cylinder during said detection period; and

indicating FDSS if said mass of fuel remains within a predetermined range during said detection period.

16. The method of claim 15 wherein said mass of fuel is a measured mass of fuel.

17. The method of claim 15 wherein said mass of fuel is a commanded mass of fuel.

18. The method of claim 15 wherein said detection period is at least one engine cycle.

19. The method of claim 15 further comprising:

monitoring an air to fuel (A/F) ratio within said cylinder; and

monitoring a mass of air ingested by said cylinder.

20. The method of claim 19 wherein said mass of fuel is based on said A/F ratio and said mass of air ingested by said cylinder.

21. The method of claim 19 wherein said A/F ratio is shifted to be contemporaneous with an intake event of said cylinder during a current engine cycle.

22. The method of claim 19 wherein said mass of air ingested is shifted to be contemporaneous with a current A/F ratio.

23. The method of claim 15 further comprising determining an average mass of fuel for said detection period.

24. The method of claim 23 wherein said predetermined range is based on said average mass of fuel.

25. The method of claim 23 wherein said predetermined range includes a lower limit based on said average mass of fuel and a steady state threshold.

26. The method of claim 23 wherein said predetermined range includes an upper limit based on said average mass of fuel and a steady state threshold.

27. A method of identifying fuel dynamical steady state (FDSS) of an engine having a cylinder, comprising:

monitoring a mass of fuel ingested by said cylinder during a detection period;

determining a steady state range based on an average of said mass of fuel over said detection period and a steady state threshold; and

indicating FDSS if said mass of fuel remains within said steady state range during said detection period.

28. The method of claim 27 wherein said mass of fuel is a measured mass of fuel.

29. The method of claim 27 wherein said mass of fuel is a commanded mass of fuel.

30. The method of claim 27 wherein said detection period is at least one engine cycle.

31. The method of claim 27 further comprising:

monitoring an air to fuel (A/F) ratio within said cylinder; and

monitoring a mass of air ingested by said cylinder.

32. The method of claim 31 wherein said mass of fuel is based on said A/F ratio and said mass of air ingested by said cylinder.

33. The method of claim 31 wherein said A/F ratio is shifted to be contemporaneous with an intake event of said cylinder during a current engine cycle.

34. The method of claim 31 wherein said mass of air ingested is shifted to be contemporaneous with a current A/F ratio.